

This listing of claims will replace the originally filed claims in the application.

Listing of Claims

Claims 1 – 22 (canceled).

Claim 23 (new): A method for the controlled continuous cooling of a subject fluid by using a cooling fluid comprising:

- a) introducing said subject fluid into a containing member, wherein said subject fluid is in the liquid state, said containing member further comprising an upper end and a lower end,
- b) providing a cooling fluid to a tank, wherein said tank is fluidly connected to said containing member by at least one conduit,
- c) introducing said cooling fluid into said containing member,
- d) directly contacting said cooling fluid with said subject fluid in said containing member,
- e) cooling said subject fluid, wherein said cooling fluid enters the vapor phase,
- f) removing said cooling fluid in the vapor state and said subject fluid from said containing member.

Claim 24 (new): The method according to claim 23, wherein said subject fluid is a consumable good.

Claim 25 (new): The method of claim 23, wherein said subject fluid is a food product.

Claim 26 (new): The method of claim 23, wherein said subject fluid is single-phase.

Claim 27 (new): The method of claim 23, wherein said subject fluid is multi-phase.

Claim 28 (new): The method of claim 27, wherein said subject fluid contains solid bodies.

Claim 29 (new): The method according to claim 23, wherein the contact between the cooling fluid and the subject fluid takes place at a pressure greater than atmospheric.

Claim 30 (new): The method according to claim 29, wherein the cooling fluid fed to the containing member is pressurized.

Claim 31 (new): The method according to claim 29, wherein the pressure in the containing member is used to evacuate the subject fluid from said containing member.

Claim 32 (new): The method according to claim 29, wherein the pressure in the containing member is regulated by the pressure drop through a valve positioned in a discharge conduit for said cooling fluid in vapor state.

Claim 33 (new): The method according to claim 29, wherein the pressure in the containing member is regulated on the basis of the level of the subject fluid in said containing member.

Claim 34 (new): The method according to claim 23, wherein the cooling fluid is selected from the group consisting of N₂, CO₂ and Ar.

Claim 35 (new): The method according to claim 23, wherein said subject fluid is removed at the lower end of said containing member, and said cooling fluid in vapor state are removed from the upper end of said containing member.

Claim 36 (new): The method according to claim 35, wherein said vapor is inserted into the containing member to facilitate mixing between the subject fluid and the cooling fluid.

Claim 37 (new): The method according to claim 36, wherein the inserted vapor is chemically identical to the cooling fluid.

Claim 38 (new): The method according to claim 36, wherein the inserted vapor is chemically different from the cooling fluid.

Claim 39 (new): The method according to claim 23, wherein one or more of the temperature, the pressure and the level of the fluid in the containing member is continuously controlled..

Claim 40 (new): The method according to claim 36, wherein the vapor is inserted into the containing member in accordance with the physical characteristics of the subject fluid which is present in said containing member.

Claim 41 (new): An apparatus for the controlled continuous cooling of a subject fluid by using a cooling fluid comprising:

- a) a tank of cooling fluid, said cooling fluid comprising a liquefied gas,
- b) a containing member,
- c) said tank being connected to said containing member by a cooling fluid conduit,
- d) said containing member comprising a subject fluid conduit,
- e) said containing member comprising at least one internal chamber to which said cooling fluid conduit and said subject fluid conduit are connected and within which said subject fluid is placed into direct contact with said cooling fluid,
- f) said containing member comprising cooling gas discharge conduit and cooled subject fluid discharge conduit through which cooling fluid in vapor phase and cooled subject fluid are separately extracted after their mutual direct contact.

Claim 42 (new): The apparatus according to claim 41, wherein cooling fluid conduit is connected to the containing member via an injector with an orifice sized for the entry of said cooling fluid into said containing member.

Claim 43 (new): The apparatus according to claim 41, wherein said cooling fluid conduit is connected to the containing member by a pipe provided with a flow control valve.

Claim 44 (new): The apparatus according to claim 42, wherein a vapor conduit is connected to the liquefied gas conduit, said vapor conduit feeding said vapor to said injector when the flow of liquefied gas to the containing member through said cooling fluid conduit ceases.

Claim 45 (new): The apparatus according to claim 42, wherein said cooling gas discharge conduit is connected to a circuit unit, said circuit unit comprising recycle conduits and said injector, wherein said circuit unit withdraws part of said vapor from said cooling gas discharge conduit and injects it into said containing member in order to facilitate mixing of said cooling fluid with said subject liquid.

Claim 46 (new): The apparatus according to claim 45, wherein said circuit unit is connected to a feed conduit for powering fluid.

Claim 47 (new): The apparatus according to claim 45, wherein an auxiliary gas conduit is connected to a lower part of said containing member in order to feed gas or vapor into said containing member to facilitate mixing of the cooling fluid with the subject fluid.

Claim 48 (new): The apparatus according to claim 41, wherein said cooling gas discharge conduit comprises a valve member enabling the pressure in the interior of said member to be regulated.

Claim 49 (new): The apparatus according to claim 41, further comprising plant control means connected to measurement means for measuring one or more of the temperature, the pressure, or the level of the fluids within said containing member.